MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2018/2019

TCN2141 – COMPUTER NETWORKS

(All sections / Groups)

12 MARCH 2019
2.30 p.m. – 4.30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 3 pages with 5 questions only
2. Attempt **ALL FIVE** questions.
3. All questions carry equal marks and the distribution of the marks for each question is given.
4. Please print all your answers in the answer booklet provided.

QUESTION 1

a) Given a host IP address with CIDR as 126.235.4.1/17. The administrator wants to create 512 subnets:

i. Find the subnet mask required.
ii. What is the current IP address subnet range?
iii. What is the subnet number for the 8th subnet?
iv. What is the subnet broadcast address for 15th subnet?
v. What are assignable addresses for the 25th subnet?
vi. What is 10th usable IP address in 35th subnet?

b) What is Autonomous System (AS)?

c) List **THREE** types of autonomous systems (ASs), and make a comparison between them.

[6+ 1 + 3 =10 Marks]

QUESTION 2

a) What are the main problems a transport protocol must solve to achieve reliable transfer?

b) What is the difference between a group-shared tree and a source-based tree in the context of multicast routing?

c) Define the following terms used in Network Management: *managing entity and managed device; management agent, Management Information Base (MIB) and network management protocol.*

d) How does TCP handle packet loss?

[2 + 2 + 4+ 2 =10 Marks]

QUESTION 3

a) Briefly answer the following question about fragmentation? (each 1 mark)
i. Where an IP datagram may get fragmented?
ii. What happens when a datagram must be fragmented to traverse a network, but the "don't fragment" flag in the datagram is set?
iii. Will all the fragments of a datagram reach the destination using the same path?
iv. What happens to the original IP datagram when one or more fragments are lost?
v. Will all the fragments of a datagram arrive at the destination system in the correct order?

Continued.....

b) Expand the following IPv6 addresses

i. ::f53:6382: ab00:67db:bb27:7332
ii. 2819: af ::35: cb2:b271
iii. 140:1abc:419a:a000::

c) Describe **TWO** categories of Internet Control Message Protocol (ICMP) messages.

[5+ 3 + 2 =10 Marks]

QUESTION 4

a) What is the purpose of an Address Resolution Protocol (ARP)?

b) What is the piece of information in a packet upon which the forwarding decision is made in each of the following approaches to switching?
   i. datagram approach
   ii. virtual-circuit approach

c) Briefly explain **FOUR** types of delays in a packet-switched network.

d) Distinguish between centralized and decentralized Peer-to-Peer (P2P) networks.

[2 +2 +4+ 2 = 10 Marks]

QUESTION 5

a) Why do HyperText Transfer Protocol (HTTP), File Transfer Protocol(FTP), Simple Mail Transfer Protocol (SMTP) and Post Office Protocol (POP3) run on top of Transmission Control Protocol (TCP) rather than on User Datagram Protocol (UDP)?

b) When a router receives an IPv4 packet, it lowers the packet's time-to-live (TTL) value by one. If the TTL value drops to zero, the packet is discarded and an Internet Control Message Protocol (ICMP) message is returned to the sender. How can this mechanism be used to trace the route a packet will follow when going from A to B?

c) The difference between UDP and IP packets is minimal. Why shouldn't applications use IP directly?

d) Calculate IP header checksum if an IP header is given as below

4500002855704000800600000A0058143A1B5613

e) Validate the above (in question d) checksum output at receiver's side and show that the IP header has no error.

[2+2+2+3+1 = 10 Marks]

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